

4. On a new and interesting Annectant Genus of *Muridæ*, with Remarks on the Relations of the Old- and New-World Members of the Family. By OLDFIELD THOMAS, Natural History Museum.

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(Plate V.)

By the kindness of Prof. Alphonse Milne-Edwards I have been entrusted with the description of a specimen which has been in the Paris Museum for some years, where it has borne the unpublished name of "*Malacomys ferrugineus*," a name by which it has been incidentally referred to in print, and which therefore, so far as the species is concerned, I now retain in order to avoid confusion.

The genus may be termed

DEOMYS¹, g. n.

General external form as in *Mus*. Pollex with a narrow nail. Hind feet elongate.

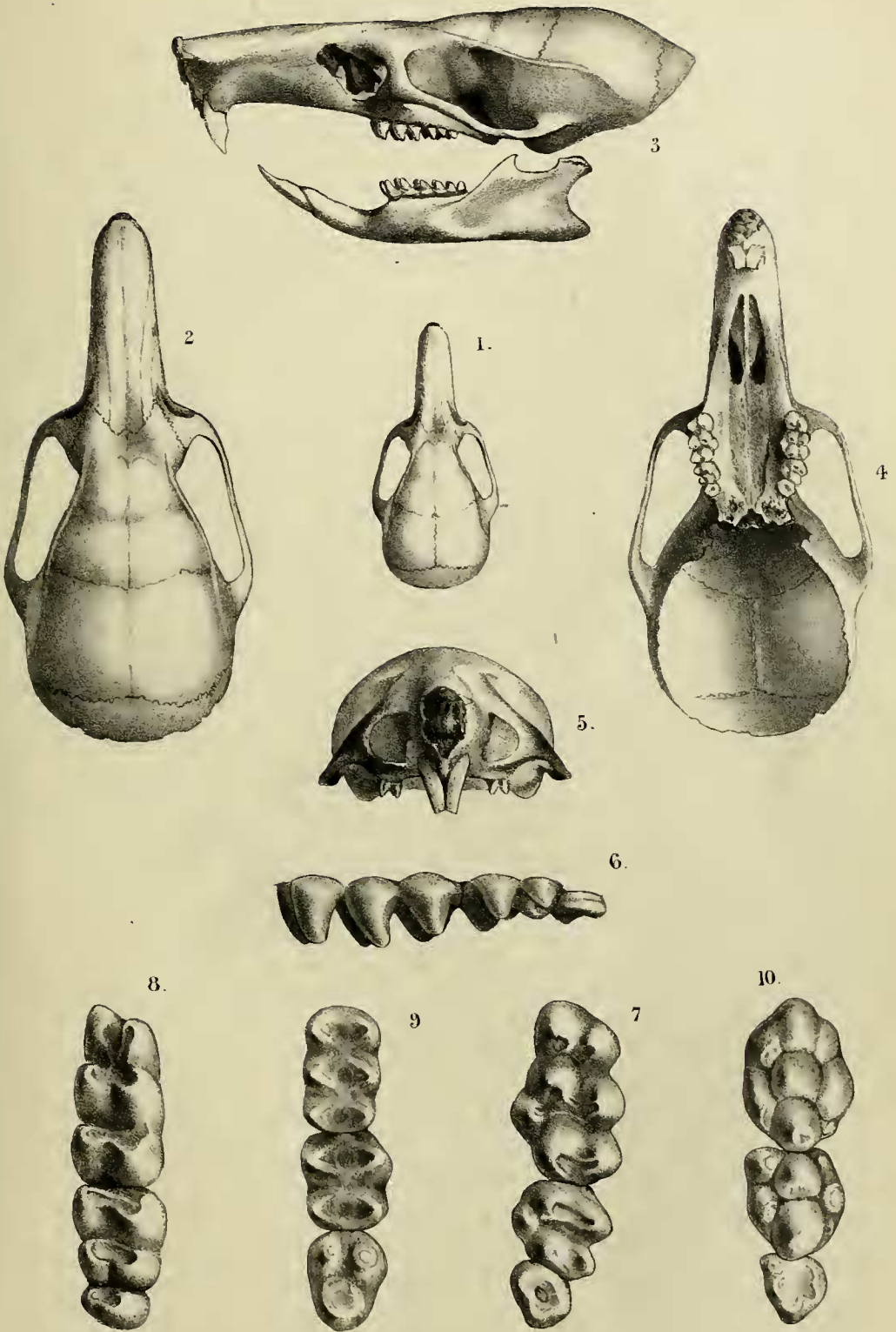
Infraorbital foramen triangular, not narrowed below, its external plate slender, not produced forwards. Upper incisors each with two minute, almost microscopic, grooves; lower incisors smooth. Anterior upper molars with seven distinct and prominent cusps, arranged 2-3-2, the extra one on the middle lamina² placed quite internal to the general series. Second molars not placed obliquely; with five cusps arranged 3-2, as in *Mus*, but the antero-internal cusp not pushed forwards in front of the others. Lower molars with the cusps biserially arranged as usual. All the cusps above and below unusually high and distinct, connected with one another by quite low and inconspicuous enamel ridges.

DEOMYS FERRUGINEUS, sp. n.

General colour of head and body a clear pale red or reddish fawn-colour, thickly grizzled along the centre of the back with black, but the reddish colour of the cheeks, shoulders, sides, and hips quite clear and unmixed. Face rather duller in general tone; area round eyes black, not sharply defined. Ears very large, oval, rounded;

¹ δέω, I link.

² To avoid the too frequent use of such terms as the "anterior internal" cusp, or "central cusp of the middle lamina," it would be useful to have a simple formula for the naming of each cusp. This might be done by calling the three laminae of \overline{m}^1 A, B, and C, and their respective cusps 1, 2, and 3, counting from outside inwards. Thus the cusps just quoted would be A 3 and B 2 respectively, while one would say of *Deomys* that the cusp-formula of its \overline{m}^1 was A 1, 2; B 1, 2, 3; C 1, 2, since it is without the A 3 present in *Mus*, and possesses the B 3 absent in the *Criceti*. The same formula is of course equally applicable to \overline{m}^2 or any other tooth. The reason for numbering the cusps from the outside inwards is that *Deomys* shows that the third cusp has been added on the inner side, and therefore that the two cusps of *Cricetus* are homologous with the two outer cusps of *Mus*.





laid forward (in spirit-specimens), they would no doubt reach to or beyond the anterior canthus of the eye. Hairs of back nearly white at their bases, then slate-coloured, their tips reddish, or, along the centre, black. Whole of underside and inner sides of limbs pure sharply defined white, the back of the lower leg, however, slaty grey. Hands and feet white. Feet long and slender; fifth hind toe (without claw) barely reaching to the base of the fourth; hallux reaching about to the level of the middle of the fifth. Soles quite naked, smooth, the pads small, rounded, prominent, only five in number, the postero-external one of the complete Murine set of six absent. Tail very long, slender, finely and distinctly scaled, the scales about 12 or 13 to the centimetre; its proximal half almost naked, with just a few minute hairs between the scales; these gradually increase in numbers, the terminal half being sufficiently thickly clothed for the scales to be nearly or quite hidden; colour of tail sharply bicolor from base to tip, above slaty grey, below white, the hairs and scales both so coloured.

Skull (Plate V. figs. 1-5) very light, slender, and delicate, with a very long narrow parallel-sided muzzle. Nasals not tapering backwards, but as broad behind as in the middle, their posterior margin directly transverse; frontal process of premaxilla not reaching to the level of the back of the nasals. Interorbital space broad, smooth, evenly convex, its edges with a slight but distinct beading. Zygomata but little expanded, very thin and weak, their two anterior roots, upper and lower, about equal both in thickness and length; the zygomata, therefore, commencing at a much lower level than in *Mus*, and the lower root entirely without the broad external projecting plate so characteristic of the typical *Mures*. Infraorbital foramen large, open, and rounded, not at all narrowed below. Palate narrow, its edges square and sharp-edged, continued behind the level of the last molar for about two millimetres; palatal foramina short, ending some distance in front of m^1 . Lower jaw unusually low, light, and slender.

Incisors orange above, yellow below, the upper ones narrow, flat in front, not bevelled; with two minute vertical grooves down the face of each. Molars with their pattern as already described; their cusps very high, pointed, and sharply defined; m^1 as long as m^2 and m^3 together.

Dimensions of the type, an adult specimen, stuffed:—

Head and body 125 millim.; tail 172 (extreme tip imperfect); hind foot 33·8; ear (dried) 17; heel to tip of hallux 23, of fifth toe 25·5; to front of last foot-pad 17·8; to point between bases of third and fourth toe 26·6.

Skull:—basal length (c.) 29·0; greatest breadth 16·0; nasals, length 14·0, greatest breadth 4·0; interorbital breadth 6·7; interparietal, length (c.) 4·5, breadth 9·2; lower anterior zygoma-root, diameter 1·8; infra-orbital foramen, height 3·2, breadth (c.) 1·9; distance from outer corner of one foramen to that of the other 9·6; palate, length 18·5, breadth outside m^1 8·1, inside m^1 4·1; diastema, length 9·9; palatal foramina, length 5·2; length of whole upper

molar series 5·6, of m^1 3·5, of m^2 1·9, of m^3 1·0; lower jaw, length (bone only) 20·0, (to incisor tips) 22·0; vertical diameter of ramus below m^1 3·0, just behind symphysis 1·7; angle to tip of coronoid process 8·0; length of lower molar series 5·6.

Hab. Lower Congo (*M. Petit*).

The very special and unusual interest that this new genus possesses lies in the fact that it represents a "missing link" in the phylogeny of the Muridæ, as it is intermediate between the two great groups of that family, the *Mures* and *Criceti*¹. The distinction between these two groups is, broadly, that the upper molars of the latter have their cusps arranged biserially, while in those of the former they are triserially placed. (Plate V. figs. 9 and 10.)

Deomys therefore (Plate V. fig. 7), with its bicuspitate anterior and tricuspidate middle lamina of m^1 , shows an intermediate condition between the two, and probably represents an early stage in the evolution of a triserially from a biserially arranged dentition. That it is not a later specialization of the Murine group through the loss of the cusp A 3 is shown by the very primitive characters present both in m^2 and in the formation of the infraorbital foramen. In the complete systematic arrangement of the Muridæ, therefore, we shall have to look upon *Deomys* as forming by itself a special section, the *Deomyes*, intermediate between the *Mures* and *Criceti*.

From the distribution of the two latter groups, and the characters of their fossil allies, it has long been recognized by students of the subject that the *Criceti*, with their comparatively simple teeth, represent the original Muridæ, once spread over nearly the whole world², but now, owing to the competition of the more highly specialized *Mures*, almost confined to America and Madagascar, in each of which places they still form the only Muridæ. It has frequently been stated or assumed that they are *entirely* confined to these two parts of the globe, and on this assumption, without reference to the palæontological history of the group, great and altogether disproportionate stress has been laid upon their distribution as affording evidence of the more or less direct connection of the American and Madagascar faunæ³. As a matter of fact, no instance can better support Mr. Wallace's views⁴ on the derivation, and especially on the undoubtedly American relationships, of the Madagascar fauna, since the three conditions on which his views are based—viz.: (1) the lowly nature and therefore considerable antiquity of the Madagascar forms, (2) their former wider distribution, and (3) their powerlessness to resist the competition of rival forms now paramount in Africa—are all conspicuously present in the *Criceti*, the group to which the

¹ This group has been called the "Sigmodontes" by most English and American authors; but that name should give way to "Criceti" for reasons shown below. See also Winge, Vid. Medd. 1881, pp. 25 and 54; E Museo Lundii, iii. p. 109 (1887).

² There is as yet no evidence of the former presence of any Cricetine form in the Australian region.

³ Cf., for example, Kolbe (SB. Nat. Freund. 1887, p. 147), whose remarks are based on Peters's account of *Nesomys* (*op. cit.* 1870, p. 54).

⁴ "Island Life," p. 383 *et seqq.* (1880).

Madagascar Muridæ wholly belong. Thus Cricetine Muridæ, now at their highest development in America, were certainly paramount at one time in Africa, where the intermediate *Deomys* now occurs, as in other parts of the Old World, and have only recently (since the separation of Madagascar) been supplanted by the more highly specialized *Mures*. This supplanting, however, has never been quite completed, since in the Old World there still survive several Cricetine genera, mostly much modified (e. g. *Arvicola* and its allies), but in some cases with scarcely any appreciable changes at all (e. g. *Mystromys*, *Cricetus*, and, so far as its teeth are concerned, *Lophiomys*).

And this brings me to the second part of the subject, a part that for reasons of nomenclature is much to be regretted, but which obviously has to be investigated, namely, as to the amount of generic distinction actually existing between the Old-World *Cricetus* and the New-World *Hesperomys*. So far as I know, they have hardly ever been properly compared, being always presumed to be distinct in the absence of proof to the contrary. On trying to tabulate the differences, however, and keeping in mind at the same time the extent of variation found in the American species, I find that one by one they vanish into thin air, leaving no distinctive character whatever. The large cheek-pouches of *Cricetus* are commonly looked upon as a marked characteristic of the genus, but, although small, they occur, distinct and well developed, in many species of *Hesperomys*, especially in those from the extreme north¹. The teeth of *Cricetus*, again, are very like those of many of the species of *Hesperomys*, especially if those of a "*Cricetulus*" (e. g. *C. phæus*) be compared with those of some of the species of "*Oryzomys*"², having similarly six paired cusps, while those of "*Vesperimus*"³ have only five, the cusp A 2 being here obsolete or united with A 1. A still closer resemblance, amounting in fact almost to identity, exists between the structure of the teeth in *Cricetus* and in the Dormouse-like subgenus *Rhipidomys*⁴. In the skull the shape of the infraorbital foramen, of the supraorbital ridges, and of the palate may be equally easily matched among the numerous and widely varying species of "*Hesperomys*." Finally the peculiar shortness of tail characteristic of *Cricetus* is almost, if not quite, equalled in the North-American subgenus *Onychomys*⁵.

The inevitable conclusion is thus forced upon us that the genus *Hesperomys* must be abolished altogether, and the species united

¹ In the widely spread white-footed Field-Mouse of N. America (*Cricetus leucopus*, as it will now have to be called), northern specimens have deep and distinct cheek-pouches, while in southern ones they are, at least in spirit-specimens, almost inappreciable. See Allen, Bull. Mus. Comp. Zool. i. p. 229 (1869), and Coues, Mon. N. Am. Rod. p. 67 (1877).

² E. g. *Cricetus palustris* or *longicaudatus*.

³ Among which are included *Cricetus leucopus*, *californicus*, *auricolus*, *taylori*, *michiganensis*, *truei*, *aztecus*, and *mexicanus*.

⁴ See, for example, the teeth of *Cricetus* (*Rhipidomys*) *leucodactylus*, *latimanus*, *sumichrasti*, *mastacalis*, or *selateri*.

⁵ Of which the species are *Cricetus leucogaster* and *C. torridus*.